



STATE OF MAINE
DEPARTMENT OF TRANSPORTATION
16 STATE HOUSE STATION
AUGUSTA, MAINE
04333-0016

JOHN ELIAS BALDACCI
GOVERNOR

DAVID A. COLE
COMMISSIONER

March 2, 2004
Subject: Hampden
Project No. STP-8593(00)X
PIN 8593.00
Bid Amendment No. 2

Dear Sir/Ms.:

Please make the following changes to your bid package.

Add the attached one page entitled "Special Provision Section 310 Plant Mix Recycled Pavement (PM RAP)".

Delete "Special Provision Section 310 Plant Mixed Recycled Asphalt Pavement", dated December 10, 2003 five pages total, and replace with the attached "Special Provision Section 310 Plant Mixed Recycled Asphalt Pavement", dated February 11, 2004 five pages total.

Consider these changes prior to submitting your bid on March 3, 2004.

Sincerely,

Scott Bickford
Contracts & Specifications Engineer



PRINTED ON RECYCLED PAPER

SPECIAL PROVISION
SECTION 310
PLANT MIX RECYCLED ASPHALT PAVEMENT
(PM RAP)

Mix Design

The PLANT MIX RECYCLED ASPHALT PAVEMENT on this project will be treated with the following material proportions:

EMULSION	2.75 %
Water	3 %
Portland cement (Type I or II)	1.25 %

The optimum moisture content for compaction shall be determined by the Department using samples obtained from the roadway, by means of AASHTO T 180, Method D.

A contract modification will be executed if percentages change from the requirements above for added asphalt, Portland cement or lime changes by more than 0.10%. Positive and negative price adjustments will be made. The price adjustment will be based upon receipted bills for materials delivered the project site. If a price adjustment is warranted, the contractor will supply the Department with all receipted bills for PG asphalt binder, Portland cement or lime for the entire project. Adjustments in water content exceeding the initial targets shall not be paid for directly, but shall be incidental.

SPECIAL PROVISION
SECTION 310
PLANT MIXED RECYCLED ASPHALT PAVEMENT

310.01 Description This work shall consist of the removal of all bituminous pavement from the existing roadway, hauling the bituminous pavement to an approved location, and processing as per Section 310.020. The gravel base of the existing roadway shall be regarded and compacted to the tolerances shown on the typicals, or as directed by the Resident.

All plant mixed recycled asphalt pavement shall be placed in one or more courses on an approved base and in accordance with these specifications, and in reasonably close conformity with the lines, grades and thicknesses indicated on the plans, or as established by the Resident. Excess recycled material not used in the PMRAP process will become the property and responsibility of the contractor.

MATERIALS

310.020 Composition of Mixture The mixture shall be composed as directed in the job mix formula. The recycled asphalt pavement shall be processed by the Contractor so all material will be no larger than 37.5 mm [1.5 in] and stockpiled so as to minimize segregation. The stockpile shall be free of any materials not generally considered to be asphalt pavement. If additional material is required, the material will be supplied by the State or acquired from the Contractor through the Contract Modification process.

A job mix formula shall be furnished by the Department establishing the percentage of emulsified asphalt cement, Portland Cement, aggregate, and water to be used in the mixture. The JMF additive proportions will be verified by taking a second recycled material sample once the stockpiles have been constructed.

Emulsion, water, aggregate and Portland Cement shall be added in percentage by weight and verified by tank checks done in accordance with the minimum quality control frequencies. Cement additive may be done in dry form or introduced as a cement slurry.

310.021 Emulsified Asphalt The emulsified asphalt shall be grade MS-2, MS-4, CSS-1, or HFMS-2 meeting the requirements of Section 702.04 - Emulsified Asphalt.

310.022 Portland Cement Portland Cement shall be Type I or II meeting the requirements of AASHTO M85-89.

310.023 Water Water shall be clean and free from deleterious concentrations of acids, alkalis, salts or other organic or chemical substances.

310.024 New Aggregate New aggregate, if required by the contract or job mix, shall meet the requirements of Section 411.02 - Untreated Aggregate Surface Course.

EQUIPMENT

310.030 Mixing Plant The mixing plant shall be of sufficient capacity and coordinated to adequately handle the proposed construction. Either a continuous pugmill mixer or a continuous drum type mixing plant shall be used. If a

drum mixing plant is used it shall meet the requirements of Section 401.07. The mixing plant shall be capable of producing a uniform mixture meeting the requirements of the job mix formula.

310.031 Hauling Equipment Trucks used for hauling the mixture shall meet the requirements of Section 401.08.

310.032 Bituminous Pavers Pavers shall meet the requirements of Section 401.09.

310.033 Rollers Rollers shall meet the requirements of Section 401.10.

CONSTRUCTION REQUIREMENTS

310.040 Mixing The recycled asphalt pavement shall be delivered to the mixer at a temperature of not less than 10°C [50°F]. The emulsified asphalt shall meet the mixing temperature requirements listed in Section 702.05 - Application Temperatures. Recycled pavement and emulsified asphalt, and cement shall be proportioned and the mixing time set to produce a mixture in which uniform distribution of the emulsified asphalt and coating of the recycled pavement is obtained.

If a drum type mixing plant is used, the recycled asphalt pavement may be heated prior to being mixed with the emulsified asphalt to a temperature not to exceed 90°C [195°F].

Following mixing, the recycled asphalt pavement material shall be stockpiled and incorporated into the work. The material shall not be stockpiled for longer than 24 hours.

310.041 Weather Limitations The plant mixed recycled asphalt pavement shall be performed when:

- a. PM-RAP operations will be allowed between May 15th and September 15th inclusive in Zone 1 - Areas north of US Route 2 from Gilead to Bangor and north of Route 9 from Bangor to Calais. Foaming operations will be allowed between May 1st and September 30th inclusive in Zone 2 - Areas south of Zone 1 including the US Route 2 and Route 9 boundaries.
- b. The atmospheric temperature, as determined by an approved thermometer placed in the shade at the recycling location, is 10°C [50°F] and rising.
- c. When there is no standing water on the surface.
- d. During generally dry conditions, or when weather conditions are such that proper pulverizing, adding, mixing, and curing can be obtained using proper procedures, and when compaction can be accomplished as determined by the Resident.
- e. When the surface is not frozen and when overnight temperatures are expected to be above 0°C [32°F].

310.042 Spreading and Finishing The mixture shall be spread and finished in accordance with Section 401.15. Total layer thickness greater than 100 mm [4 in] will be placed in 2 lifts.

310.043 Compaction Compaction of the mixture shall be in accordance with Section 401.16. Rolling may be delayed to avoid lateral displacement as directed by the Resident. See also Section 310.051.

310.044 Joints Joints shall be constructed in accordance with Section 401.17.

310.045 Surface Tolerances The surface tolerances shall be as specified in Section 401.101, except that the maximum allowable variation shall be 10 mm [$\frac{3}{8}$ in]. The surface tolerance in existing gravel areas covered by PMRAP, with no additional gravel, shall be ± 10 mm [$\frac{3}{8}$ in].

TESTING REQUIREMENTS

310.050 Quality Control The Contractor shall operate in accordance with the approved Quality Control Plan (QCP) to assure a product meeting the contract requirements. The QCP shall meet the requirements of Section 106.6 - Acceptance and this Section. The Contractor shall not begin recycling operations until the Department approves the QCP in writing.

Prior to performing any recycling process, the Department and the Contractor shall hold a Pre-recycle conference to discuss the recycling schedule, type and amount of equipment to be used, sequence of operations, and traffic control. A copy of the QC random numbers to be used on the project shall be provided to the Resident. All field and plant supervisors including the responsible onsite recycling process supervisor shall attend this meeting.

The QCP shall address any items that affect the quality of the Recycling Process including, but not limited to, the following:

- a. JMF(s).
- b. Mixing details, pugmill type, production rates, material processing.
- c. Make and type of paver(s).
- d. Make and type of rollers including weight, weight per inch of steel wheels, and average contact pressure for pneumatic tired rollers.
- e. Testing Plan.
- f. Transportation including process for ensuring that truck bodies are clean and free of debris or contamination that could adversely affect the finished product, type of release agent used (if required)
- g. Laydown operations including procedures for mix design modification, avoiding recycling and curing in inclement weather, material yield monitoring, methods to ensure that segregation is minimized, longitudinal joint construction, procedures to determine the maximum rolling and placing speeds based on field quality control, and achieving the best possible smoothness.
- h. Methods for protecting the finished product from damage and procedures for any necessary corrective action.
- i. Method of grade checks.
- j. Examples of Quality Control forms.
- k. Name, responsibilities, and qualifications of the Responsible onsite Recycling Supervisor experienced and knowledgeable with the process.
- l. Method for calibration/verification of density gauge.
- m. A note that all testing will be done in accordance with AASHTO and MDOT/ACM procedures.
- n. Stockpile procedures including method of moisture control.

The Project Superintendent shall be named in the QCP, and the responsibilities for successful implementation of the QCP shall be outlined.

The Contractor shall sample, test, and evaluate the PMRAP process in accordance with the following procedures and minimum frequencies:

MINIMUM QUALITY CONTROL FREQUENCIES

Test or Action	Frequency	Test Method
Density	1 per 300 m [1000 ft] / lane	ASTM D 2950
Air Temperature	4 per day at even intervals	
Surface Temperature	At the beginning and end of each days operation	
Yield of all materials (Both the daily yield and yield since last test)	4 per day at even intervals	

The Contractor shall submit all QC test reports and summaries in writing, signed by the appropriate technician, and present them to the Department's onsite representative by 1:00 P.M. on the next working day, except when otherwise noted in the QCP due to local restrictions. The Contractor shall make all test results, including randomly sampled densities, available to the Department onsite.

The Contractor shall cease recycling operations whenever one of the following occurs:

- The computed yield differs from the approved Job Mix Formula by 10% or more.
- The Contractor fails to follow the approved QCP.
- The Contractor fails to achieve 98% density after corrective action has been taken.

Recycling operations shall not resume until the Contractor and the Department agree on the corrective action to be taken.

310.051 Test strip The contractor shall assemble all items of equipment for the recycling operation on the first day of the recycling work. The Contractor shall construct a test strip for the project at a location approved by the Resident. The test strip section is required to:

- Demonstrate that the equipment and processes can produce recycled layers to meet the requirements specified in these special provisions;
- Determine the effect on the grading of the recycled material by varying the forward speed of the paving machine; and;
- Determine the sequence and manner of rolling necessary to obtain the compaction requirements and establish a target TMD. The Contractor and the Department will calibrate their respective gauges at this time.

The test strip shall be at least 100 m [300 ft] in length of a full lane-width (or a half-road width).

Full PMRAP production will not begin until an acceptable test strip has been constructed. If a test strip fails to meet the requirements of this specification, the Contractor will be required to repair or replace the test strip to the

satisfaction of the Resident. Any repairs, replacement, or duplication of the test strip will be at the Contractor's expense.

Quality Assurance density testing of the recycled material will be performed by the Department using the nuclear method. After the test strip has been placed, it will be rolled as directed until the nuclear density readings show an increase in density of less than 16 kg/m³ [1 pcf] for the final four roller passes. The test strip density will be used as the target density for the recycled material. The remaining PMRAP material shall be compacted to a minimum density of 98% of the target density as determined in the control section.

ACCEPTANCE TEST FREQUENCY

Property	Frequency	Test Method
In-place Density	1 per 600 m [2000 ft] / lane	ASTM D 2950

310.052 Repairs Repairs and maintenance for the PMRAP layers, during and after the curing period, resulting from damage caused by traffic, weather or environmental conditions, or caused by the Contractor's operations or equipment, shall be completed at no additional cost to the Department.

Low areas will be repaired using a hot mix asphalt shim course. Areas up to 25mm [1 in] high can be repaired by milling or shimming with hot mix asphalt. Areas higher than 25mm [1 in] will be repaired using a hot mix asphalt shim. All repair work will be done with the Resident's approval at the Contractor's expense.

310.06 Curing No new hot mix asphalt pavement or additional layers of PM-RAP shall be placed on the recycled asphalt pavement until a curing period of (4) four days has elapsed. The curing period starts once the PM-RAP has been placed in the roadway. When weather conditions are unfavorable, the curing period may be extended by the Resident.

310.07 Method of Measurement Plant Mixed Recycled Asphalt Pavement shall be measured by the square meter [square yard].

310.08 Basis of Payment The accepted quantity of Plant Mixed Recycled Asphalt Pavement will be paid for at the contract unit price per square meter [square yard], complete in-place which price will be full compensation for furnishing all equipment and labor for removing existing pavement, regrading and compacting existing gravel base, processing, mixing, testing, placing, and compacting, excess material relocation, and for all incidentals necessary to complete the work.

Payments will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
310.23 - 75mm [3 in] Plant Mixed Recycled Asphalt Pavement	Square Meter [yd ²]
310.24 - 100mm [4 in] Plant Mixed Recycled Asphalt Pavement	Square Meter [yd ²]
310.25 - 125mm [5 in] Plant Mixed Recycled Asphalt Pavement	Square Meter [yd ²]
310.26 - 150mm [6 in] Plant Mixed Recycled Asphalt Pavement	Square Meter [yd ²]